**REASSESSMENT REPORT**

**JOHN P. SAAD & SONS, INC.**
**NASHVILLE, DAVIDSON COUNTY, TENNESSEE**

**EPA ID NO. TND 065833543**

**Prepared for**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**
**Region 4**
**61 Forsyth Street, SW, 11th Floor**
**Atlanta, Georgia 30303**

| | | |
|---|---|---|
| TDD No. | : | 04-9911-0027 |
| Date Prepared | : | September 8, 2000 |
| Contract No. | : | 68-W5-0021 |
| Prepared by | : | Tetra Tech EM Inc. |
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September 15, 2000

Derek Matory
Remedial Project Manager
U.S. Environmental Protection Agency Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, Georgia 30303

Subject: **Reassessment Report**
**John P. Saad & Sons**
**Contract No. 68-W5-0021 (START)**
**EPA ID No. TND 065833543**
**TDD No. 04-9911-0029**

Dear Mr. Matory:

The Tetra Tech EM Inc., Superfund Technical Assessment and Response Team (START) is submitting one copy of the Reassessment Report for the John P. Saad & Sons facility in Nashville, Davidson County, Tennessee. Also included are one copy each of the confidential page scoresheets, Site Inspection Worksheets, and the Comprehensive Environmental response, Compensation and liability Act eligibility Form.

If you have any questions or need additional copies of the Reassessment Report, please contact me at (615) 771-3892.

Sincerely,

Randall L. Woodlee

Randall L. Woodlee
START Project Manager

cc: Charles Swan, EPA Project Officer (letter only)
Cindy Gurley, EPA Process Owner (letter only)
Steve Pierce, START Program Manager (letter only)
Joseph Baer, START Site Assessment Coordinator (letter only)
START File

**CONTENTS**

## 1.0 INTRODUCTION

This reassessment report has been prepared in accordance with the requirements of Technical Direction Document (TDD) No. 04-9911-0029, which the U.S. Environmental Protection Agency (EPA) Region 4 assigned to the Tetra Tech EM Inc. (Tetra Tech), Superfund Technical Assessment and Response Team (START). START was tasked to prepare a reassessment report for the John P. Saad & Sons (Saad) site in Nashville, Davidson County, Tennessee.

The reassessment will focus on updating and reevaluating information relevant to previous preliminary assessment and site inspection (PA/SI) and Hazard Ranking System (HRS) efforts. The primary objective of an SI is to determine whether a facility has the potential to be placed on the National Priorities List (NPL). The NPL identifies facilities at which a release, or threatened release, of hazardous substances poses a serious enough risk to public health or the environment to warrant further investigation and possible remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act of 1986. Information gathered during the PA/SI is used to generate a preliminary HRS score. The HRS is the primary criterion EPA uses to determine whether a facility should be placed on the NPL. A reassessment of the PA/SI may be conducted to generate a new preliminary HRS score for a site when there is reason to suspect that updated information may yield a substantially different score. This reassessment report evaluates the operational, regulatory, and investigative history of the site, particularly with respect to HRS considerations, and provides a recommendation regarding further action.

Specifically, the objectives of the Reassessment Report are as follows:

- Obtain and review relevant file material
- Identify and attempt to fill data gaps, as necessary
- Evaluate target populations for the groundwater migration, surface water migration, soil exposure, and air migration pathways.

Information reviewed for the reassessment report was gathered from EPA Region 4 CERCLA files that includes a 1986 EPA PA/SI conducted by Technical Assistance Team contractor, Roy F. Weston, Inc.,

and a final removal action report prepared by Signal Environmental Services, Inc., for the Saad Site Steering Committee and approved by EPA Region 4 in January 1996.

## 2.0 SITE BACKGROUND

Saad is located at 3655 Trousdale Road in Nashville, Davidson County, Tennessee. The geographic coordinates of the site are approximately 36°05' 7" north latitude and 86°45'02" west longitude. Most of the area surrounding the site is classified as industrial. The Saad site consists of less than 1 acre and is currently owned and occupied by Ellis and Kathy Saad.

Saad is bordered on the north Klein Custom Coach, on the east by Trousdale Drive, on the south by Franklin Brick Company, and on the west by CSX Transportation. The CSX property is contiguously adjacent to the Saad property and is essentially a berm inclined to the west from the Saad property. The CSX berm is approximately 15 feet high and steeply sloped with the edge approximately 10 feet from the Saad property boundary.

Saad has been the subject of a series of environmental investigations and a multi-phase removal action dating back to 1989. John P. Saad & Sons began operations as a waste oil pick-up service on Trousdale Drive in 1970. Waste oil was brought to the site in tank trucks, and in 1978, the Tennessee Department of Water Quality Control discovered a discharge impoundment behind the facility that contained organic waste solvents.

The Saad site's close proximity to Croft Springs which is now owned by the Nashville Zoo at Grassmere Park, caused EPA Region 4 to investigate the site. On November 29, 1989, EPA Region 4 issued an Administrative Order by Consent requiring a complete cleanup of the site within 120 days. To date, four removal actions have been conducted at Saad. To facilitate the cleanup at the site, the Saad Site Steering Committee (SSSC) was established to direct the removal activities. Surface removal and exploratory trenching was conducted by the SSSC from March 1990 to January 1991 under the original AOC. Then a removal action and field investigation (RA/FI) was conducted by DRE Inc. (DRE), for the SSSC under the original AOC from August through October 1991. DRE conducted a second RA/FI (phase II) for the SSSC from October 1992 to January 1993 under a second EPA Region 4 AOC. Signal Environmental conducted phase III of the removal action for the SSSC from September to December 1994 under a third

EPA Region 4 AOC. During phase III of the RA, ALCOA performed an additional removal action in December 1994 under a separate EPA Region 4 AOC immediately following Signal Environmental's RA for the SSSC.

The following summary presents the volume and type of waste removed:

| Removal Phase | Dates | Volume and Type of Materials Removed |
|---|---|---|
| Phase I | March 1990 to January 1991 | 72.35 tons hazardous waste solids |
| | | 16,300 gallons nonhazardous liquids |
| Phase IA RA/FI | August to October 1991 | 8,500 gallons nonhazardous liquids |
| | | 100 cubic yards nonhazardous debris |
| | | 21 drums hazardous waste |
| | | 105 drums nonhazardous waste |
| Phase II RA/FI | October 1992 to January 1993 | 34 drums nonhazardous waste |
| | | 56 drums hazardous waste |
| | | 68,000 gallons nonhazardous liquids |
| | | 268 cubic yards nonhazardous waste |
| | | 20 cubic yards nonhazardous sludge |
| Phase III | September to December 1994 | 685 tons hazardous soil |
| | | 222 tons nonhazardous soil |
| | | 20,000 gallons nonhazardous liquid |
| Phase III (ALCOA) | December 1994 | 1,600 tons hazardous waste, soil, sludge |
| | | 39,467 gallons nonhazardous liquid |

Phase IV (final RA) began on October 17, 1995, and was completed on January 19, 1996. This RA was ordered by Region 4 EPA under a Unilateral Administrative Order (UAO) and initially required an evaluation of the levels of six organic contaminants in soil at the Saad site. The contaminants at Saad are listed below with corresponding soil removal action levels. The soil action levels were established by the

EPA Region 4 Groundwater Protection Branch in order to protect surface water at the site and surrounding area.

| Contaminant | Soil Action Level (milligram per kilogram [mg/kg]) |
|---|---|
| • Tetrachloroethylene (PCE) | 3.0 |
| • Vinyl chloride | 30.0 |
| • Ethyl benzene | 3,190 |
| • Toluene | 6,000 |
| • Benzene | 6.0 |
| • Trichloroethylene (TCE) | 10.0 |

The end objective of the final removal action was to remove all soil and sludge with any contaminant exceeding the previously identified action levels. In addition to the work explicitly required in the UAO, this removal action included removal of impacted soil identified by the Tennessee Department of Environment and Conservation (TDEC), Division of Superfund (TDSF) under the UAO by letter agreement between TDSF and SSSC, which was approved by EPA Region 4.

A sampling grid was established over the site for systematically identifying contamination levels. The sampling grid was established on the site in the areas that were not addressed during the three prior RAs. The sampling grid allowed for a 10-foot offset from all building structures. Soil samples were collected using a stainless steel spoon and a trackhoe bucket. The sampling equipment was decontaminated following procedures specified in the EPA-approved sampling plan. The trackhoe bucket and sampling spoon were cleaned prior to sampling each discrete sample at each depth.

One hundred thirty six soil samples were collected for analysis and subsequent comparison of the resulting data to the soil action levels. Each grid was sampled at 5-foot depth intervals starting with 2.5 feet. At the point where groundwater, perched water, immovable obstruction, or bedrock was encountered, sampling ceased.

Confirmation sample analysis indicates that soil action levels were achieved in each grid. Furthermore, data indicate that contaminant levels (for each of the six contaminants) are below method detection limits

of 0.5 mg/kg for each contaminant. In addition, removal of contaminated soil to less than 0.5 mg/kg exceeds Region 9 preliminary remediation goals (PRG) standards for industrial and residential soil.

Removal and disposal of 1,681 tons of impacted soil and debris was conducted appropriately in accordance with the EPA's off-site disposal policy and the UAO. In addition to the contaminated soil, 26 buried drums were removed during the RA. The drums appeared to contain pigments for inks and paints. Open excavations were backfilled with a combination of clean surge rock, number 57 stone, number 67 stone, and 2- to 3-inch stone. After the excavations were filled, a clay cover followed by woven geotextile separation fabric was installed throughout the site so that a 95 percent proctor compaction was achieved, and surface water infiltration reduced.

Seven groundwater monitoring wells were installed at the site by EPA in 1982. The monitoring wells were sampled and analyzed during the 1986 PA/SI and data for a well near the impoundment indicates migration of the previously identified contaminants from the impoundment. However, these wells were not sampled during the final RA. In addition, the wells were plugged and abandoned as part of the EPA directed site restoration activities.

## 3.0 PATHWAYS

### 3.1 GROUNDWATER MIGRATION PATHWAY

The Saad site is located within the Central Basin Physiographic Province of Tennessee. The area is characterized by rolling hills, meandering creeks and rivers, and an abundance of karst topographic features. Some of the karst solution features present in the area are caves, sinkholes, conduits, and various other solution cavities.

Soil classifications beneath the Saad site is part of the Arrington-Lindell-Armour soil association. This soil is typically present along the flood plains of the Cumberland, Stones, and Harpeth rivers and Mill and Whites creeks. The two specific soil types on site are the Lindell-Urban soil types which is moderately well-drained, brown silt loam about 62 inches thick and the Talbott-Urban soil type which is well-drained, brown silt loam about 40 inches thick. Permeability for these soil types ranges from 0.6 to 2.0 inches per hour.

The dominant rock types underlying Nashville, Tennessee belong to two geologic groups, the Nashville Group and the underlying Stones River Group. The Nashville Group consists of three Ordovician-age formations. These formations are, in descending order from youngest to oldest, the Cathys formation, the Bigsby Cannon limestone, and the Hermitage formation. The Cathys formation is the uppermost formation in the Nashville group and ranges from 50 to 175 feet thick. It is an impure limestone with a thin, calcareous shale bed. The Bigsby Cannon limestone, a brownish gray formation, ranges from 50 to 125 feet thick. The oldest formation in the Nashville group is the Hermitage formation. It ranges from 50 to 100 feet thick and is composed of sandy limestone interbedded with shale units. The Stones River Group is composed, from top to bottom, of the following Ordovician formations: Carters limestone, Lebanon limestone, Ridley limestone, Pierce limestone, Murfreesboro limestone, Wells Creek dolomite, and Knox dolomite. The Carters limestone is 65 feet thick and consists mostly of massively bedded limestone. The Lebanon limestone is well exposed in the Central Basin. It is about 115 feet thick. The light gray, dense and massive Ridley limestone is about 105 feet thick. The 25-foot-thick Pierce formation consists of gray, medium- to coarse-grained, silty limestone. The Murfreesboro formation is about 420 feet thick and consists of blue and brown fine-grained limestone. The Well Creek formation, composed of silty dolomite and dolomite limestone, ranges in thickness from 0 to 75 feet. It is composed of gray and brown fine-grained to granular dolomite and dense white limestone. The Knox dolomite contains the oldest sedimentary rocks underlying the Central Basin. It is not exposed; its nearest approach to the surface is within about 300 feet in Rutherford County.

Nearly all groundwater in the Central Basin is contained in the openings formed by the solution in the limestone. The composition of the limestone greatly affects the rate of dissolution; the purer limestones are usually more easily dissolved. Records indicate that a vast majority of these solution openings occur at depths of less than 300 feet. The predominant aquifer-bearing formations near the site that are capable of yielding potable water are, from shallow to deep, the Carters limestone and the Knox Group. Records indicate that the vast majority of these solutions openings occur at depths of less than 300 feet. The amount of water from these limestone aquifers is controlled by the horizontal and vertical solution openings as well as by joint spacings. Groundwater moves from highland areas to lowland discharge points following irregular flow paths along the bedding planes and fractures.

Water from the Knox dolomite varies in quality and quantity. Of 40 wells inventoried, nearly 83 percent of Knox wells in Davidson County had yields less than 5 gallons per minute. The amount of dissolved

solids ranges from 500 to 2,000 parts per million. The Lebanon limestone, which lies just below the Carters limestone and is approximately 115 feet thick, is another potential groundwater source for the area. The quality of water from this formation is usually good; however, yield is generally less than 5 gallons per minute (gpm). The Carters limestone is limited as a water-bearing formation by the overlying, clay-bearing, Hermitage formation. Approximately 60 percent of the Carters limestone wells yield less than 5 gpm. Water from the Carters limestone is generally high quality. Wells drilled near the Saad site have groundwater levels as close to the surface as 35 feet below land surface. Groundwater flow at the Saad site follows topographic low areas eastward towards Mill Creek. Hydraulic conductivities for aquifers with subsurface materials similar to the above formations vary (ranging from $1 \times 10^{-4}$ to $1 \times 10^{-2}$ centimeters per second).

The Nashville Water Department supplies potable water for the entire 4-mile radius of the site. The Nashville Water Department obtains water from two surface water intakes on the Cumberland River. There are no municipal groundwater wells serving the Nashville area, and no well water is purchased from other districts.

A 4-mile well survey was not conducted; however, no private wells were observed near the site during the 1985 preliminary assessment, and no wells for process water are known to exist within the site's industrial area. According to TDEC, Division of Groundwater Protection records, there are private wells within the 4-mile radius; however, the wells are predominantly used for gardening, and all residents have municipal water available. Seven groundwater monitoring wells were installed at the site by EPA in 1982. The monitoring wells were sampled and analyzed during the 1986 PA/SI and data for a well near the impoundment indicates migration of the previously identified contaminants from the impoundment. However, these wells were not sampled during the final RA. In addition, the wells were plugged and abandoned as part of the EPA directed site restoration activities. No current groundwater sample data were available in the site file.

### 3.2 SURFACE WATER MIGRATION PATHWAY

Surface water overland drainage from the site flows eastward into Seven Mile Creek which flows for approximately 1.5 mile to Mill Creek. Mill Creek flows northward for approximately 4 miles and converges with the Cumberland River. The average flow rate for Mill Creek is 30 to 40 cubic feet per

second (cfs) and 20,500 cfs for the Cumberland River. No wetlands have been identified along the 15-mile surface water pathway.

The Cumberland River supplies drinking water for the Metro Nashville Water Department from the blended KR Harrington and Omohundro surface water intakes. The KR Harrington intake is located near the confluence of the Stones and Cumberland Rivers, approximately 11 miles upstream from the site. The Omohundro intake is located on the Cumberland River about 0.5 mile downstream from the confluence of Mill Creek, approximately 3 miles downstream from the site. The two blended intakes account for a total average production of 82.2 million gallons per day (mgd). Both intakes are distributed evenly with each drawing 41.1 mgd. The total number of persons serviced by the Metropolitan Nashville Water Department is 416,257 with 135,585 service connections. The apportioned population served by each intake is approximately 208,129.

The only federally designated endangered species that inhabits Mill Creek is the Nashville crayfish, *Orconectes shoupi*. No wetlands have been identified along the 15-mile surface water pathway. Recreational fishing does occur in Mill Creek and the Cumberland River. No sediment or surface water samples were collected from Mill Creek to characterize the surface water pathway during the 1986 PA/SI.

### 3.3 SOIL EXPOSURE PATHWAY

The 1,681 tons of removed contaminated soil was considered a hazardous waste source to evaluate this site. However, the entirety of the contaminated soil was removed, and contaminant levels were reduced to below detection limits of 0.5 mg/kg. After the excavation was backfilled, the site was capped with clean clay and geotextile fabric to eliminate exposure and reduce vertical hydraulic permeability.

### 3.4 AIR MIGRATION PATHWAY

Based on the Bureau of the Census 1990 population data, the population within a 4-mile radius is distributed as follows: 0 to 0.25 mile, 206 persons; 0.25 to 0.5 mile, 167 persons; 0.5 to 1 mile, 4,640 persons; 1 to 2 miles, 18,857 persons; 2 to 3 miles, 37,032 persons; and 3 to 4 miles, 54,526 persons. The total population for the 4-mile radius is 115,428.

No air sample data are available in site files. Few targets are associated with the soil and air pathways at the Saad site or the adjacent industrial area. There are no operations ongoing at the site or on-site workers.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

As described in Section 2.0 of this report, removal and landfill disposal of 1,681 tons of contaminated soil from the Saad site was conducted properly. Soil RA levels that were achieved were below Region 9 industrial and residential PRGs and the site was capped to eliminate exposure and reduce surface water infiltration; therefore, the removal should be considered a qualifying RA. However, the site was evaluated assuming this was a non-qualifying removal (with the 1,681 tons of soil removed as a source) to ensure that the site does not pose a threat to human health or the environment.

Given the karst hydrology in the region, groundwater is considered a susceptible pathway. No private wells were observed near the site during the 1985 preliminary assessment and no wells for process water are known to exist within the site's industrial area. According to TDEC, Division of Groundwater Protection records, there are private wells within the 4-mile radius; however, the wells are predominantly used for gardening, and all residents have municipal water available. No groundwater sample data were available in the site file.

Croft Springs is located in the 4-mile radius of the site and could be a potential groundwater to surface water pathway; however, results from a dye trace study performed at the Saad site by Crawford and Associates indicates that the water table in the Saad site area was well above the top of bedrock and contamination would travel slowly through the regolith before entering a limestone conduit leading to surface water. A conduit from groundwater aquifers to Croft Springs is undocumented.

The surface water migration pathway was evaluated based on potential release to Mill Creek, a habitat for the federally endangered Nashville crayfish and a tributary of the Cumberland River. The river is identified as a fishery and sensitive environment with a drinking water intake. Surface water data were not available in site files.

For scoring purposes, the 1,681 tons of contaminated soil was considered a hazardous waste source.

However, the entirety of the contaminated soil was removed, and contaminant levels were reduced to below detection limits of 0.5 mg/kg.

After the excavation was backfilled, the site was capped with clean clay, and geotextile fabric was installed to eliminated exposure and reduce vertical hydraulic permeability. No air sample data are available in site files; however, few targets are associated with the soil and air pathways at the Saad site or the adjacent industrial area. There are no operations ongoing at the site or on-site workers.

Based on low target scores and the removal of the source, no further action is recommended.

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# HAZARD RANKING SYSTEM PRELIMINARY SCORE FOR JOHN P. SAAD & SONS, INC. NASHVILLE, DAVIDSON COUNTY, MISSISSIPPI EPA ID TND 065833543

Pathways evaluated using the site inspection (SI) worksheets were groundwater migration, surface water migration, soil exposure, and air migration.

## Pathway Scores

$S_{gw}=4.0$
$S_{sw}=0.56$
$S_{se}= 0.36$
$S_{air}=44.9$

**OVERALL SCORE = 3.5**

Sources and Waste Characteristics

The site score for the Saad & Sons site was based on a hazardous waste quantity (HWQ) value of 10 for the groundwater migration, surface water migration, soil exposure, and air migration pathways. Waste quantity information was derived from the volume of contaminated soil at the site identified in the 1986 preliminary assessment and site investigation and a 1996 Final Removal Action Report prepared by Signal Environmental Services, Inc., a contractor hired by the Saad Site Steering Committee. CERCLA-eligible sources of contamination at the Saad site consist of approximately 1,681 cubic yards of soil contaminated with tetrachloroethylene, trichloroethylene, vinyl chloride, toluene, ethyl benzene, and benzene that was removed from the Saad site in 1995. Based on 1991 EPA guidance for removal actions, this removal should constitute a qualifying removal action because removal levels achieved exceeded residential soil action levels.

By removing contaminated soil levels to below established remediation goals for industrial and residential soils, and providing a clay cap over the site to reduce vertical hydraulic permeability, this removal action should be considered a qualifying removal action. However, the site was scored assuming that this was a non-qualifying removal to ensure the site does not pose a threat to human health or the environment.

Groundwater Migration Pathway

A 4-mile well survey was not conducted; however, no private wells were observed near the site during the 1986 site investigation, and no wells for process water are known to exist within the site's industrial area. According to Tennessee Department of Environment and Conservation, Division of Groundwater

Protection records, there are private wells within the 4-mile radius; however, the wells are predominantly used for gardening, and all residents have municipal water available. Seven groundwater monitoring wells were installed at the site by EPA in 1982. The monitoring wells were sampled and analyzed during the 1986 PA/SI and data for a well near the impoundment indicates migration of the previously identified contaminants from the impoundment. However, these wells were not sampled during the final RA. In addition, the wells were plugged and abandoned as part of the EPA directed site restoration activities. No current groundwater data were available in site files.

Surface Water Migration Pathway

The surface water migration pathway was evaluated based on a potential release to Mill Creek, a habitat for the federally endangered Nashville crayfish and a tributary of the Cumberland River. The river is identified as a fishery and sensitive environment. There is a drinking water intake on the Cumberland River, approximately 0.5 mile downstream from the confluence of Mill Creek, approximately 9.1 downstream from the site.

Analytical results for surface water within the 4-mile radius were not available in file material.

Soil Exposure and Air Migration

For scoring purposes, the 1,681 tons of contaminated soil was considered a hazardous waste source. However, the entirety of the contaminated soil was removed, and contaminant levels were reduced to below detection limits of 0.5 milligram per kilogram.

After the excavation was backfilled, the site was capped with clean clay and geotextile fabric to eliminate exposure and reduce vertical hydraulic permeability. No air sample data are available in site files; however, few targets are associated with the soil and air pathways at the Saad site or the adjacent industrial area. There are no operations ongoing at the site or on-site workers.

Conclusions

Based on low target scores and the removal of the source, no further action is recommended.

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GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

| | Likelihood of Release to an Aquifer | Maximum Value | Value Assigned |
|---|---|---|---|
| 1. | Observed Release | 550 | 0 |
| 2. | Potential to Release | | |
| | 2a. Containment | 10 | 10 |
| | 2b. Net Precipitation | 10 | 6 |
| | 2c. Depth to Aquifer | 5 | 5 |
| | 2d. Travel Time | 35 | 35 |
| | 2e. Potential to Release (lines 2a x [2b + 2c + 2d]) | 500 | 460 |
| 3. | Likelihood of Release (higher of lines 1 and 2e) | 550 | 460 |
| | Waste Characteristics | | |
| 4. | Toxicity/Mobility | [a] | 10,000 |
| 5. | Hazardous Waste Quantity | [a] | 10 |
| 6. | Waste Characteristics | 100 | 18 |
| | Targets | | |
| 7. | Nearest Well | 50 | 0 |
| 8. | Population | | |
| | 8a. Level I Concentrations | [b] | 0 |
| | 8b. Level II Concentrations | [b] | 0 |
| | 8c. Potential Contamination | [b] | 20 |
| | 8d. Population (lines 8a + 8b + 8c) | [b] | 0 |
| 9. | Resources | 5 | 0 |
| 10. | Wellhead Protection Area | 20 | 0 |
| 11. | Targets (lines 7 + 8d + 9 + 10) | [b] | 20 |
| | Groundwater Migration Score for an Aquifer | | |
| 12. | Aquifer Score ([lines 3 x 6 x 11]/82,500)[c] | 100 | 20 |
| | Groundwater Migration Pathway Score | | |
| 13. | Groundwater Migration Pathway Score ($S_{gw}$)[c] (highest value from line 12 for all aquifers evaluated) | 100 | 2.0 |

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SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

| Factor Categories and Factors | Maximum Value | Value Assigned |
|---|---|---|
| **DRINKING WATER THREAT** | | |
| Likelihood of Release | | |
| 1. Observed Release | 550 | 0 |
| 2. Potential to Release by Overland Flow | | |
| 2a. Containment | 10 | 10 |
| 2b. Runoff | 25 | 1 |
| 2c. Distance to Surface Water | 25 | 6 |
| 2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c]) | 500 | 70 |
| 3. Potential to Release by Flood | | |
| 3a. Containment (Flood) | 10 | 0 |
| 3b. Flood Frequency | 50 | 0 |
| 3c. Potential to Release by Flood (lines 3a x 3b) | 500 | 0 |
| 4. Potential to Release (lines 2d + 3c, subject to a maximum of 500) | 500 | 0 |
| 5. Likelihood of Release (higher of lines 1 and 4) | 550 | 70 |
| Waste Characteristics | | |
| 6. Toxicity/Persistence | [a] | 40 |
| 7. Hazardous Waste Quantity | [a] | 10 |
| 8. Waste Characteristics | 100 | 3 |
| Targets | | |
| 9. Nearest Intake | 50 | 0 |
| 10. Population | | |
| 10a. Level I Concentrations | [b] | 0 |
| 10b. Level II Concentrations | [b] | 0 |
| 10c. Potential Contamination | [b] | 1.6 |
| 10d. Population (lines 10a + 10b + 10c) | [b] | 1.6 |
| 11. Resources | 5 | 0 |
| 12. Targets (lines 9 + 10d + 11) | [b] | 1.6 |

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Continued

| Factor Categories and Factors | Maximum Value | Value Assigned |
|---|---|---|
| **DRINKING WATER THREAT (Concluded)** | | |
| Drinking Water Threat Score | | |
| 13. Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100) | 100 | 0.004 |
| **HUMAN FOOD CHAIN THREAT** | | |
| Likelihood of Release | | |
| 14. Likelihood of Release (value from line 5) | 550 | 70 |
| Waste Characteristics | | |
| 15. Toxicity/Persistence/Bioaccumulation | [a] | $2 \times 10^5$ |
| 16. Hazardous Waste Quantity | [a] | 10 |
| 17. Waste Characteristics | 1,000 | 32 |
| Targets | | |
| 18. Food Chain Individual | 50 | 0 |
| 19. Population | | |
| 19a. Level I Concentrations | [b] | 0 |
| 19b. Level II Concentrations | [b] | 0 |
| 19c. Potential Human Food Chain Contamination | [b] | 22 |
| 19d. Population (lines 19a + 19b + 19c) | [b] | 2 |
| 20. Targets (lines 18 + 19d) | [b] | 2 |
| Human Food Chain Threat Score | | |
| 21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100) | 100 | 0.05 |
| **ENVIRONMENTAL THREAT** | | |
| Likelihood of Release | | |
| 22. Likelihood of Release (value from line 5) | 550 | 70 |

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Concluded

| Factor Categories and Factors | Maximum Value | Value Assigned |
|---|---|---|
| **ENVIRONMENTAL THREAT (Concluded)** | | |
| Waste Characteristics | | |
| 23. Ecosystem Toxicity/Persistence/ Bioaccumulation | [a] | $2 \times 10^5$ |
| 24. Hazardous Waste Quantity | [a] | 10 |
| 25. Waste Characteristics | 1,000 | 32 |
| Targets | | |
| 26. Sensitive Environments | | |
| 26a. Level I Concentrations | [b] | 0 |
| 26b. Level II Concentrations | [b] | 0 |
| 26c. Potential Contamination | [b] | 26.25 |
| 26d. Sensitive Environments (lines 26a + 26b + 26c) | [b] | 26.25 |
| 27. Targets (value from line 26d) | [b] | 26.25 |
| Environmental Threat Score | | |
| 28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60) | 60 | 0.07 |
| **SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED** | | |
| 29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100) | 100 | 0.754 |
| **SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE** | | |
| 30. Component Score ($S_{of}$)[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100) | 100 | 0.754 |

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
- Not evaluated.
* Default value.

SOIL EXPOSURE PATHWAY SCORESHEET

| Factor Categories and Factors | | Maximum Value | Value Assigned |
|---|---|---|---|
| **RESIDENT POPULATION THREAT** | | | |
| | Likelihood of Exposure | | |
| 1. | Likelihood of Exposure | 550 | 550 |
| | Waste Characteristics | | |
| 2. | Toxicity | [a] | 10,000 |
| 3. | Hazardous Waste Quantity | [a] | 10 |
| 4. | Waste Characteristics | 100 | 18 |
| | Targets | | |
| 5. | Resident Individual | 50 | 0 |
| 6. | Resident Population | | |
| | 6a. Level I Concentrations | [b] | 0 |
| | 6b. Level II Concentrations | [b] | 0 |
| | 6c. Resident Population (lines 6a + 6b) | [b] | 0 |
| 7. | Workers | 15 | 0 |
| 8. | Resources | 5 | 0 |
| 9. | Terrestrial Sensitive Environments | [d] | 0 |
| 10. | Targets (lines 5 + 6c + 7 + 8 + 9) | [b] | 0 |
| | Resident Population Threat Score | | |
| 11. | Resident Population Threat ([lines 1 x 4 x 10]/82,500) | [b] | 0 |
| **NEARBY POPULATION THREAT** | | | |
| | Likelihood of Exposure | | |
| 12. | Attractiveness/Accessibility | 100 | 0 |
| 13. | Area of Contamination | 100 | 0 |
| 14. | Likelihood of Exposure | 500 | 0 |
| | Waste Characteristics | | |
| 15. | Toxicity | [a] | 10,000 |
| 16. | Hazardous Waste Quantity | [a] | 10 |
| 17. | Waste Characteristics | 100 | 18 |

SOIL EXPOSURE PATHWAY SCORESHEET, Concluded

| Factor Categories and Factors | | Maximum Value | Value Assigned |
|---|---|---|---|
| **NEARBY POPULATION THREAT** (Concluded) | | | |
| | Targets | | |
| 18. | Nearby Individual | 1 | 1 |
| 19. | Population Within 1 Mile | [b] | 3.9 |
| 20. | Targets (lines 18 + 19) | [b] | 4.9 |
| | Nearby Population Threat Score | | |
| 21. | Nearby Population Threat ([lines 14 x 17 x 20]/82,500) | [b] | 0.6 |
| **SOIL EXPOSURE PATHWAY SCORE** | | | |
| 22. | Soil Exposure Pathway Score ($S_{soil}$)[c] (lines 11 + 21, subject to a maximum of 100) | 100 | 0.6 |

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
[d] No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.

**Confidential**

AIR MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

| | Likelihood of Release | Maximum Value | Value Assigned |
|---|---|---|---|
| 1. | Observed Release | 550 | 0 |
| 2. | Potential to Release | | |
| | 2a. Gas Potential to Release | 500 | 500 |
| | 2b. Particulate Potential to Release | 500 | 0 |
| | 2c. Potential to release higher of lines 2a and 2b) | 500 | 500 |
| 3. | Likelihood of Release (higher of lines 1 and 2c) | 550 | 500 |
| | **Waste Characteristics** | | |
| 4. | Toxicity/Mobility | [a] | 10,000 |
| 5. | Hazardous Waste Quantity | [a] | 10 |
| 6. | Waste Characteristics | 100 | 18 |
| | **Targets** | | |
| 7. | Nearest Individual | 50 | 20 |
| 8. | Population | | |
| | 8a. Level I Concentrations | [b] | 0 |
| | 8b. Level II Concentrations | [b] | 0 |
| | 8c. Potential Contamination | [b] | 41 |
| | 8d. Population (lines 8a + 8b + 8c) | [b] | 41 |
| 9. | Resources | 5 | 0 |
| 10. | Sensitive Environments | | |
| | 10a. Actual Contamination | [c] | 0 |
| | 10b. Potential Contamination | [c] | 0 |
| | 10c. Sensitive Environments (lines 10a + 10b) | [c] | 0 |
| 11. | Targets (lines 7 + 8d + 9 + 10c) | [b] | 61 |
| | **Air Migration Pathway Score** | | |
| 12. | Air Migration Pathway Score ($S_{air}$)[d] ([lines 3 x 6 x 11]/82,500) | 100 | 6.7 |

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.
[d] Do not round to nearest integer.
- Not evaluated.
* Default value.